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(54) Method of forming ornamented plastics articles

(57) The present invention relates to a method of forming ornamented plastics articles and to articles formed by the method and relates especially but not exclusively to manufacture of items of furniture, building components and picture frame members. The method comprises firstly extruding a plastics article then re-moulding it in a hot stamp press (5). This enables highly complex forms of article to be manufactured with large dimensions and at much lower cost than is currently possible.

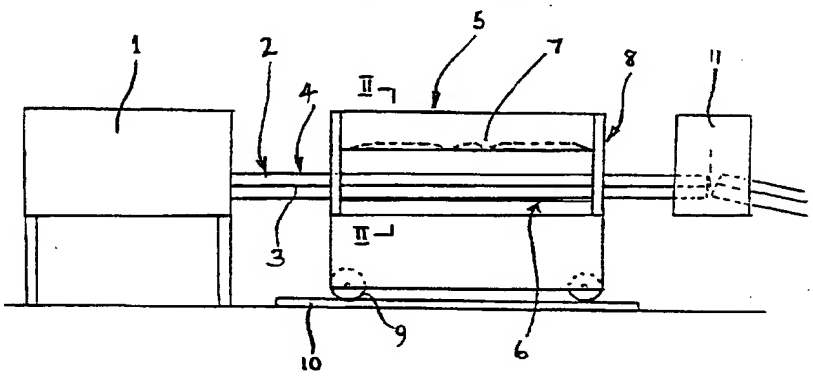

FIGURE 1

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Careful control of the temperature gradient across the extrusion 2 enables an inherent tendency of the extrusion 2 to bow upwardly to be counteracted. More particularly, heating of the platen 6 preferably by use of heated oil circulating through it, counteracts the upward bowing tendency of the extrusion 2 under pressure. Generally, the greater the depth of impression to be made onto the extrusion 2 the greater the tendency to bow and the greater the temperature of the platen 6 needs to be to counteract this.

The precise temperatures and pressures and compression times within the hot stamp press 5 are selected to suit the nature of the extrusion to he ornamented and the depth of ornamentation. The required temperature, pressure and time are generally substantially lower than for corresponding injection moulding technique and, therefore, the energy input required is relatively low. Temperatures of between 100 and 180°C are not untypical and compression times are generally between 10 and 40 seconds with pressures of the order of, for example, 5 to 10 bars per square centimetre. Temperatures below 140°C are preferable when compression times of greater than 60 seconds are used, to avoid risk of edge damage to the moulding.

The preferred size of the press 5 is of the order of 3m in length and 70cm width. This enables, for example, three or four picture frame members to be pressed simultaneously alongside each other. A press of 70cm width is also well-suited to moulding of, for example, a cabinet door which is commonly 60cm in width.

To accommodate for the continuous progression of the extrusion 2, in the illustrated assembly the hot stamp dye 5 is adapted to advance with the extrusion 2 at the same rate as the extrusion 2 by means of motorised transport carriage 8 with wheels 9 that roll along a track 10 co-extensive with the production line.

Once the ornament or moulding has been pressed on to the upper face 4 of the extrusion 2 the sectioning machine 11 cuts the extrusion into the desired lengths.

Although illustrated with respect to a picture frame member extrusion 2, the method has found applicability to a range of different items of furniture or building members. Ornamented chair legs and backs may be formed by this process as may cabinet doors and other more sizeable members.

Although the invention has been described with respect to a continuous extrusion process, the method in the invention may be carried out in discreet extrusion and hot stamp pressing stages with the extruder 1 and press 5 off-line relative to each other but suitably within convenient distance.

A positive benefit is obtained by pressing the extrusion 2 shortly after it is extruded most especially when it is of a foamed nature since this assists in the ease of pressing and reduction of need for energy inputs at the pressing stage.

In further refined aspects of the invention it has been found that hot stamp pressing of extrusions provides a distinctive somewhat distressed surface characteristic. This is most notable with "gold" or otherwise wood-coloured plastics which upon heating in the hot stamp press 5 are slightly facially burnt. The result of this effect is generally aesthetically desirable rendering the plastics material with an appearance similar to wood and, therefore, better disguising the artificiality of the material.

If desired, hot stamp foil as is commonly used in the picture frame manufacturing industry for adorning plastics extrusions with transfer patterns, can be conveniently applied to the moulding actually within the hot stamp press 5 avoiding the need for a separate application process. Suitably the hot stamp foil is reeled through the hot stamp press 5 with rollers being positioned at the entrance and exit to the press 5 so that the transfer foil passes over their rounded surfaces and is not accidentally pierced. The rollers or additional rollers may act as spindles to remove the used foil tape and to pick up the slack. The foil is suitably laid against the plastics extrusion prior to the press 5 being operated to press down upon it.

Claims

1. A method of forming ornamented plastics articles which comprises firstly extruding plastics material and then re-moulding it in a hot stamp press.

2. A system for forming ornamented plastics articles which comprises a plastics extruder in combination with a hot stamp press with a platen and a heated mould-forming press for re-moulding the upper face of the extrusion from the plastics extruder.

3. A system as claimed in Claim 2, wherein the hot stamp press is a hydraulic press of a metre or longer, and preferably of the order of 3 metres in length.

4. A system as claimed in Claim 2, wherein the platen of the hot stamp press is also heated.

5. A system as claimed in Claim 4, wherein control means are provided to control the temperature of the heated platen of the press allowing adjustment to a temperature that prevents bowing of the plastics extrusion due to the heating of the upper face of the extrusion by the press of the hot stamp press.

6. A system as claimed in Claim 2, wherein the hit stamp press has associated therewith a dispenser for hot stamp foil to dispense hot stamp foil within the hot stamp press to enable transfer patterns on the hot stamp foil to be transferred to the plastics extrusion upon pressing by the hot stamp press.

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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 4231

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	WO 92 00177 A (BRAUN PEBRA GMBH) * page 13; figure 5 *	1-4	B29C69/02
Y		6	
X	US 4 925 512 A (BRIAND JEAN P) * column 12, line 28; figure 2 *	1-3	
Y	DE 42 28 194 A (H P CHEMIE PELZER RES & DEV) * abstract *	6	
A	FR 1 395 995 A (SHNOK,SHANOK)	1,2,6	
A	FR 2 698 578 A (PROFIL)	1,2	
A	FR 1 401 394 A (MÉCANIQUE ET PLASTIQUE)	1,2	
A	US 5 401 154 A (SARGENT MICHAEL M)	1,2	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
B29C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	11 November 1997	Roberts, P

CATEGORY OF CITED DOCUMENTS
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